PLAY & LEARN

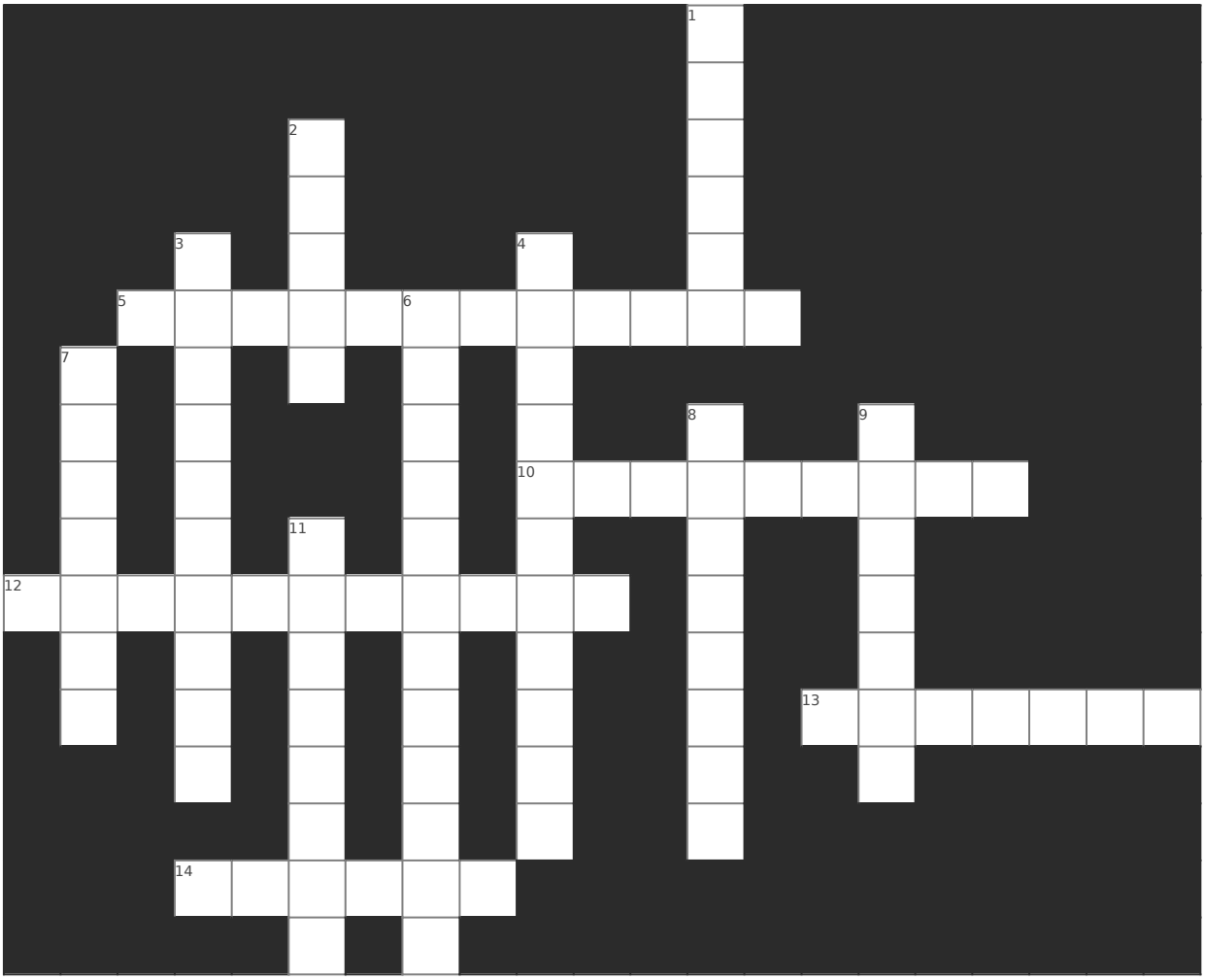
A puzzle workbook — crosswords, word searches, scrambles and quiz games

Print it. Solve it. Race a friend. Answer keys are at the back — no peeking.

#	Puzzle	Play it	Time
1	The Crossword	Solo or pairs	15 min
2	Word Search	Solo — race the clock	10 min
3	Scrambled Terms	Solo	8 min
4	Odd One Out	Teams of 4	10 min
5	Chapter Scrabble	Groups of 3–4	20 min
6	Who Am I? — Clue Cards	Whole class	15 min
7	True or False Sprint	Whole class, standing	6 min
8	Bingo	Whole class	15 min
9	Two Truths and a Lie	Pairs	10 min
10	The Escape Challenge	Teams of 4	25 min

Puzzle 1 · The Crossword

Every answer is a word from this chapter. Fill the white squares — one letter per square.



ACROSS

5. net change in position, direction included (12)

10. ____ point — needed before you can describe position (9)

12. acceleration that always points toward the centre of a circle (11)

13. ____ distance — quadruples when speed doubles (7)

14. a quantity with magnitude and direction (6)

DOWN

1. the fixed reference point of a coordinate system (6)

2. on a graph, the rate of change shown by the incline (5)

3. the branch of physics describing motion (10)

4. negative acceleration; slowing down (11)

6. rate of change of velocity (12)

7. the direction a whirled stone flies off in when released (7)

8. speed together with direction (8)

9. ____ velocity — constant speed and direction (7)

11. total path length travelled, direction ignored (8)

Bonus words that did not fit the grid — define each one in a sentence: SCALAR

Puzzle 2 · Word Search

16 terms are hiding in the grid — across, down, diagonally, and backwards. Circle each one, then tick it off the list. Beat 10 minutes and you win.

Z	G	J	W	F	R	O	R	W	H	P	A	R	G	O
C	I	R	C	U	L	A	R	Q	Q	W	Q	M	H	R
Q	A	C	C	E	L	E	R	A	T	I	O	N	U	I
G	W	T	O	E	C	N	A	T	S	I	D	J	N	G
W	R	A	D	I	U	S	S	P	E	E	D	O	I	I
K	E	L	D	B	Q	N	O	I	T	O	M	Z	F	N
L	X	G	J	W	R	M	S	Y	F	B	V	D	O	X
N	D	I	S	P	L	A	C	E	M	E	N	T	R	G
E	H	M	J	G	N	W	K	J	R	S	H	Y	M	I
X	B	B	P	T	I	I	R	I	R	A	L	A	C	S
V	E	L	O	C	I	T	Y	G	N	N	W	L	G	M
B	O	M	W	G	H	G	K	L	J	G	W	L	D	Y
G	C	H	T	E	P	O	L	S	W	P	P	O	U	I
V	F	N	B	C	R	O	T	C	E	V	P	E	J	Z
P	S	P	G	A	A	I	M	I	Y	J	J	H	S	J

☐ DISPLACEMENT	☐ ACCELERATION	☐ DISTANCE
☐ VELOCITY	☐ CIRCULAR	☐ UNIFORM
☐ BRAKING	☐ SCALAR	☐ VECTOR
☐ ORIGIN	☐ MOTION	☐ RADIUS
☐ SLOPE	☐ GRAPH	☐ SPEED
☐ GPS		

Race Rules

- **Solo:** find all the words. Note your time at the top of the page.
- **Pairs:** one partner finds across-and-down words, the other finds diagonals. First pair to complete the list wins.
- **Hard mode:** cover the word list. Find as many chapter terms as you can in 5 minutes.
- **Champion move:** for every word you find, say what it means out loud. No meaning, no point.

Puzzle 3 · Scrambled Terms

Every row is a chapter word with its letters shuffled. Unscramble it. The clue in brackets is your lifeline — try to solve without it first.

#	Scrambled letters	Clue	Your answer
1	R T I R D N E A T O A	(negative acceleration)	_____
2	L E E N A T I R T C P	(acceleration pointing toward a circle's centre)	_____
3	A M I C I N S E K T	(the study of motion without worrying about forces)	_____
4	C E D L E A T P N M S I	(straight-line change in position)	_____
5	L T G N N T A A E I	(in the direction of a circle's edge at a point)	_____
6	U I R L O T N O V E	(one complete loop of circular motion)	_____
7	L E O T I N E C R E A D	(another word for slowing down)	_____
8	I S U N T N N A A T O S E	(____ speed — what a speedometer shows right now)	_____

Make It a Game

Beat the Bell: the teacher sets a 60-second timer. Every unscrambled word inside the bell = 1 point; a word you can also *define* = 3 points.

Chain Scramble: in a circle, each student scrambles a chapter word for the person on their left. Miss it and you are out. Last student standing wins.

Puzzle 4 · Odd One Out

Three belong together. One does not. Circle the odd one — then write why in one line. The "why" is where the marks are.

#	Which is the odd one out?	Because…
1	Distance · Speed · Mass · Time (this chapter)	_____
2	Displacement · Velocity · Acceleration · Distance	_____
3	Position-time graph · Velocity-time graph · Bar chart · Slope	_____
4	$v = u + at$ · $s = ut + \frac{1}{2}at^2$ · $v^2 = u^2 + 2as$ · $F = ma$	_____
5	Satellite orbit · Stone on a string · Car braking · Merry-go-round	_____
6	Speedometer · GPS · Fitness watch · Thermometer	_____

Puzzle 5 · Chapter Scrabble

Play in groups of 3–4. You have one shared rack of letter tiles. Build only terms from this chapter — no ordinary English words allowed.

Your tile rack — cut these out or write them on paper squares:

A 1	**B** 3	**C** 3	**D** 2	**E** 1	**G** 2	**H** 4
I 1	**L** 1	**M** 3	**N** 1	**O** 1	**P** 3	**R** 1
S 1	**T** 1	**U** 1	**V** 4	**X** 8	**Y** 4	**Z** 10

Scoring:

You did this	Points
Each letter tile used	Its tile value
Word is a term from this chapter	× 2
Word is 8 letters or longer	+ 10 bonus
You can state its meaning correctly	+ 5
You can connect it to a real-life example	+ 3
Word is *not* in this chapter (challenged and lost)	− 5

How a Round Works

1. Player builds a word from the rack and lays it down.
2. Any opponent may **challenge** within 10 seconds: "That's not in this chapter."
3. Open the textbook. If the challenger is right, the word is removed and the builder loses 5 points. If the challenger is wrong, the *challenger* loses 5 points.
4. Builder states the meaning to claim the +5 bonus. The group votes on whether it was correct.
5. Play 6 rounds. Highest total wins.

Target Words (worth the most — do not show your opponents)

ACCELERATION · DISPLACEMENT · RETARDATION · CENTRIPETAL · KINEMATICS · TANGENTIAL · VELOCITY · DECELERATION

Puzzle 6 · Who Am I? — Clue Cards

Cut along the lines. One student draws a card and reads only the first clue aloud; the class guesses. Wrong guess? Read clue 2. Fewer clues used = more points.

CARD 1 ① I am the total path length, direction ignored. ② An auto-rickshaw meter measures me. ③ I am distance.	**CARD 2** ① I am the net change in position. ② A round trip gives me a value of zero. ③ I am displacement.
CARD 3 ① I am speed with a direction attached. ② GPS navigation reports me, not just speed. ③ I am velocity.	**CARD 4** ① I am the rate of change of velocity. ② A sudden bus brake makes you feel me. ③ I am acceleration.
CARD 5 ① I have magnitude only, no direction. ② Distance and speed are both examples of me. ③ I am a scalar.	**CARD 6** ① I have magnitude and direction. ② Displacement and velocity are both examples of me. ③ I am a vector.
CARD 7 ① On a graph, I show the rate of change. ② A steeper version of me means faster change. ③ I am slope.	**CARD 8** ① I always point toward the centre of a circle. ② Gravity provides me for orbiting satellites. ③ I am centripetal acceleration.
CARD 9 ① I am negative acceleration. ② Another name for me is deceleration. ③ I am retardation.	**CARD 10** ① Doubling speed quadruples me. ② I am the distance a vehicle covers after brakes are applied. ③ I am braking distance.
CARD 11 ① I fixed GPS drift caused by relativity. ② Without me, GPS would drift 10 km a day. ③ I am relativistic correction.	**CARD 12** ① I am the area under a velocity-time graph. ② I represent displacement. ③ I am the area under the curve.

Scoring: guessed after clue ① = **5 points** · after ② = **3 points** · after ③ = **1 point**

Puzzle 7 · True or False Sprint

Everyone stands. Teacher reads a statement. True → stay standing. False → sit down. Get it wrong and you are out. Last student standing wins.

#	Statement	Your call
1	Distance and displacement always have the same value.	☐ True ☐ False
2	Velocity includes both speed and direction.	☐ True ☐ False
3	A round trip has zero average displacement.	☐ True ☐ False
4	Acceleration is the rate of change of displacement.	☐ True ☐ False
5	A speedometer shows velocity, not just speed.	☐ True ☐ False
6	In uniform circular motion, the object is constantly accelerating.	☐ True ☐ False
7	Doubling your speed doubles your braking distance.	☐ True ☐ False
8	The slope of a position-time graph gives velocity.	☐ True ☐ False
9	The area under a velocity-time graph gives displacement.	☐ True ☐ False
10	Retardation is another name for positive acceleration.	☐ True ☐ False
11	Centripetal acceleration points away from the centre of a circle.	☐ True ☐ False
12	GPS satellites must correct for effects of relativity.	☐ True ☐ False
13	A whirled stone flies off in a straight line when released.	☐ True ☐ False
14	The 2-second following-distance rule fully accounts for braking distance.	☐ True ☐ False

Puzzle 8 · Bingo

Each student fills the empty grid below with any 16 words from the word bank — in any order, one per box. The teacher then reads out meanings, not names. Cross a box only when its meaning is called. First to a full row, column or diagonal shouts BINGO.

Word bank — choose any 16:

Distance	Displacement	Velocity	Acceleration
Scalar	Vector	Slope	Origin
Uniform motion	Retardation	Centripetal	Tangential
Kinematics	Braking distance	Reference point	Revolution

Your bingo card:

> **Caller’s List (teacher only — read the meaning, never the name)**
>
> ① "I am the total path length covered." ② "I am the net change in position." ③ "I am speed together with direction." ④ "I am the rate of change of velocity." ⑤ "I have magnitude only." ⑥ "I have both magnitude and direction." ⑦ "On a graph, I represent the rate of change." ⑧ "I am the fixed point you measure position from." ⑨ "I always point toward the centre of a circle." ⑩ "I am the direction an object flies off in from circular motion." □ "I am negative acceleration." □ "I quadruple when speed doubles." □ "I am one complete loop around a circle." □ "I am the branch of physics describing motion."

Puzzle 9 · Two Truths and a Lie

Each set has three statements. Two are true, one is a lie. Circle the lie — and correct it in one line.

Set 1

(a) A round trip has zero net displacement.

(b) A round trip always has zero distance too.

(c) Average velocity for a round trip is zero.

The lie is _____ . Corrected: _____

Set 2

(a) Velocity is a vector.

(b) Speed is a vector.

(c) Displacement is a vector.

The lie is _____ . Corrected: _____

Set 3

(a) In circular motion at constant speed, velocity is constant.

(b) In circular motion at constant speed, direction keeps changing.

(c) Centripetal acceleration always points toward the centre.

The lie is _____ . Corrected: _____

Set 4

(a) Braking distance is proportional to speed.

(b) Braking distance is proportional to speed squared.

(c) Doubling speed quadruples braking distance.

The lie is _____ . Corrected: _____

Puzzle 10 · The Escape Challenge

Solve all five gates. Each gives you one digit. Collect all five to unlock the exit code.

🔒 GATE 1 — The Displacement Gate

A bowler runs back 30 m then forward 40 m. Displacement = 40 − 30. Use that number.

Digit: ☐

🔒 GATE 2 — The Velocity Gate

A round trip has average velocity zero. Use the number of zeros in "zero".

Digit: ☐

🔒 GATE 3 — The Acceleration Gate

A car accelerates from 0 to 20 m/s in 10 s. a = (20-0)/10. Use that number.

Digit: ☐

🔒 GATE 4 — The Braking Gate

Doubling speed multiplies braking distance by this factor. Take the first digit.

Digit: ☐

🔒 GATE 5 — The Circular Motion Gate

A fan does 300 rpm; the time period is 60/300 = 0.2 s. Take the first non-zero digit.

Digit: ☐

EXIT CODE: ☐ ☐ ☐ ☐ ☐

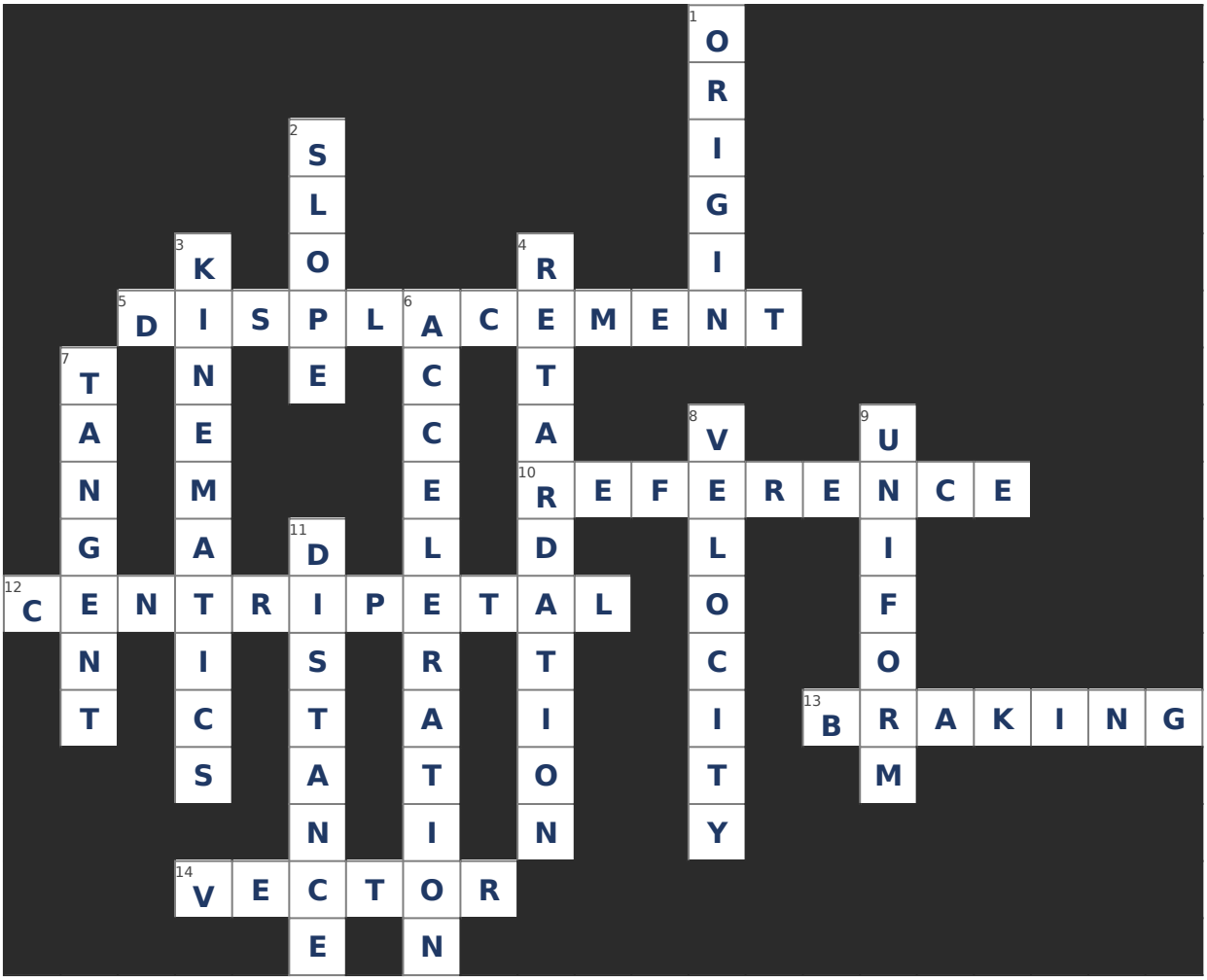
🔒 Teacher's note

Hide the gate cards around the classroom. Teams rotate every 4 minutes. First team to reach the door with the correct code escapes. Losing teams try again next period.

🔑 Answer Keys

Teachers and self-checkers only. Solve first — the puzzle is the point.

Puzzle 1 · Crossword — Solved Grid


1 O R I G I
2 S L O P E
3 K I N E M A T I C S
4 R E T A R D A T I O N
5 D I S P L A C E M E N T
6 A C C E L E R A T I O N
7 T A N G E N T
8 V E L O C I T Y
9 U N I F O R M
10 R E F E R E N C E
11 D I S T A N C E
12 C E N T R I P E T A L
13 B R A K I N G
14 V E C T O R

Across: 5 DISPLACEMENT · 10 REFERENCE · 12 CENTRIPETAL · 13 BRAKING · 14 VECTOR

Down: 1 ORIGIN · 2 SLOPE · 3 KINEMATICS · 4 RETARDATION · 6 ACCELERATION · 7 TANGENT · 8 VELOCITY · 9 UNIFORM · 11 DISTANCE

Puzzle 2 · Word Search — Solved Grid

Z	G	J	W	F	R	O	R	W	**H**	**P**	**A**	**R**	**G**	**O**
C	**I**	**R**	**C**	**U**	**L**	**A**	**R**	Q	Q	W	Q	M	H	**R**
Q	**A**	**C**	**C**	**E**	**L**	**E**	**R**	**A**	**T**	**I**	**O**	**N**	**U**	**I**
G	W	T	O	**E**	**C**	**N**	**A**	**T**	**S**	**I**	**D**	J	**N**	**G**
W	**R**	**A**	**D**	**I**	**U**	**S**	**S**	**P**	**E**	**E**	**D**	O	**I**	**I**
K	E	L	D	**B**	Q	**N**	**O**	**I**	**T**	**O**	**M**	Z	**F**	**N**

L	X	G	J	W	**R**	M	S	Y	F	B	V	D	**O**	X
N	**D**	**I**	**S**	**P**	**L**	**A**	**C**	**E**	**M**	**E**	**N**	**T**	**R**	G
E	H	M	J	G	N	W	**K**	J	R	S	H	Y	**M**	I
X	B	B	P	T	I	I	R	**I**	**R**	**A**	**L**	**A**	**C**	**S**
V	**E**	**L**	**O**	**C**	**I**	**T**	**Y**	G	**N**	N	W	L	G	M
B	O	M	W	G	H	G	K	L	J	**G**	W	L	D	Y
G	C	H	T	**E**	**P**	**O**	**L**	**S**	W	P	P	O	U	I
V	F	N	B	C	**R**	**O**	**T**	**C**	**E**	**V**	P	E	J	Z
P	**S**	**P**	**G**	A	A	I	M	I	Y	J	J	H	S	J

Puzzle 3 · Scrambled Terms

1. RETARDATION · 2. CENTRIPETAL · 3. KINEMATICS · 4. DISPLACEMENT · 5. TANGENTIAL · 6. REVOLUTION · 7. DECELERATION · 8. INSTANTANEOUS

Puzzle 4 · Odd One Out

#	Odd one	Because
1	Mass	the other three (distance, speed, time) are all directly about motion; mass is not
2	Distance	the other three are vector quantities; distance is a scalar
3	Bar chart	the other three relate specifically to motion graphs
4	F = ma	the other three are the three kinematic equations of uniformly accelerated motion
5	Car braking	the other three are examples of circular motion; braking is linear deceleration
6	Thermometer	the other three measure motion (speed/position); a thermometer measures temperature

Puzzle 7 · True or False Sprint

1-F · 2-T · 3-T · 4-F · 5-F · 6-T · 7-F · 8-T · 9-T · 10-F · 11-F · 12-T · 13-T · 14-F

Puzzle 9 · Two Truths and a Lie

Set	The lie	Correction
1	b	Distance is never zero for a round trip — you still travelled the full path both ways.
2	b	Speed is a scalar — it has magnitude only, no direction.
3	a	Velocity is not constant — its direction keeps changing even though speed does not.
4	a	Braking distance scales with speed squared, not speed itself.

Puzzle 10 · The Escape Challenge

EXIT CODE: 1 · 4 · 2 · 4 · 2

(Answer: 10) (zero has 0 zeros as digits — use 0... trick! use letter count instead: ZERO = 4) (Answer: 2) (Answer: 4) (Answer: 2)

Now go clock your own walking speed with a stopwatch — are you uniform or accelerating? □□